

U.S. Appl. No. 09/692,927
Reply to Office Action dated June 13, 2005

PATENT
450117-02828

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1 – 10. (Canceled)

11. (Currently Amended) A turbo decoder operative to use a soft output Viterbi algorithm, said turbo decoder comprising:

a plurality number of decoding units; and

a number of normalization units each located at an output side of a respective decoding unit,

wherein only a subset of the plurality of decoding units has a normalization unit associated therewith at its output side, and

wherein the number of normalization units is smaller than the number of decoding units.

12. (Previously Presented) The turbo decoder according to claim 11, wherein a decoding unit not having a respective normalization unit associated therewith at its output side is provided with data representative of a normalized output from the normalization unit of a preceding decoding unit of the subset.

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13. (Previously Presented) The turbo decoder according to claim 11, wherein the plurality of decoding units include a first decoding unit and a second decoding unit, in which only the first decoding unit has a respective normalization unit associated therewith at its output side.

14. (Previously Presented) A mobile communications device comprising a turbo decoder according to claim 11.

15. (Currently Amended) A turbo decoding method operative to use a soft output Viterbi algorithm, said turbo decoding method comprising the steps of:

using a plurality number of decoding units;

using a number of normalizing units; and

normalizing data obtained from use of each of the ~~plurality of~~ decoding units with a respective normalization factor,

wherein the data obtained from use of only a subset of the ~~plurality of~~ decoding units are normalized with a normalization factor variable during operation and the data obtained from use of the other one or ones of the plurality number of decoding units are normalized with a time constant normalization factor, and

wherein the number of normalization units is smaller than the number of decoding units.

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16. (Previously Presented) The turbo decoding method according to claim 15, wherein the time constant normalization factor is equal to one.

17. (Previously Presented) The turbo decoding method to claim 15, wherein only the one or ones of the plurality of decoding units provided with data representative of a normalized output from the respective normalization unit or units of a preceding decoding unit or units of the subset are normalized with the time constant normalization factor.

18. (Previously Presented) The turbo decoding method according to claim 15, wherein the plurality of decoding units include a first decoding unit and a second decoding unit, and

wherein the data obtained from use of the first decoding unit is normalized with the normalization factor variable during operation and the data obtained from use of the second decoding unit is normalized with the time constant normalization factor.

19. (Previously Presented) The turbo decoding method according to claim 15, wherein the normalization factor or factors are calculated on the basis of means and variance of extrinsic information produced by an associated decoding unit or units.

20. (Previously Presented) The turbo decoding method according to claim 15, wherein the plurality of decoding units are arranged in a parallel manner to enable the method to be performed as a parallel concatenated scheme.

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21. (Currently Amended) A turbo decoder operative to use a soft output

Viterbi algorithm, said turbo decoder comprising:

a number of decoding units; and

~~one or more~~ a number of normalization units, each located at an output side of the decoding unit,

wherein said decoding unit is used a plurality of times, each of said plurality of times generating an output, and

wherein only a subset of said outputs is normalized with one of said normalization units, and

wherein the number of normalization units is smaller than the number of decoding units.

22. (Previously Presented) The turbo decoder according to claim 21, wherein a decoding unit not having a respective normalization unit associated therewith at its output side is provided with data representative of a normalized output from the normalization unit of a preceding decoding unit of the subset.

23. (Previously Presented) The turbo decoder according to claim 21, wherein the plurality of generated outputs from said decoding unit includes a first output and a second output, in which only the first output has a respective normalization unit associated therewith at its output side.

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24. (Previously Presented) A mobile communications device comprising a turbo decoder according to claim 21.

25. (Currently Amended) A turbo decoding method operative to use a soft output Viterbi algorithm, said turbo decoding method comprising the steps of:

using a decoding unit; and

normalizing data obtained from aone or more normalization units with a respective normalization factor variable,

wherein said decoding unit is used a plurality of times, each of said plurality of times generating an output, and

wherein only a subset of said outputs is normalized with one of said normalization units and a remaining subset of outputs is normalized with a time constant normalization factor,

wherein the number of normalization units is smaller than the number of decoding units.

26. (Previously Presented) The turbo decoding method according to claim 25, wherein the time constant normalization factor is equal to one.

27. (Previously Presented) The turbo decoding method to claim 25, wherein only the outputs normalized with one of said normalization units are normalized with the time constant normalization factor.

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28. (Previously Presented) The turbo decoding method according to claim 25,
wherein the plurality of generated outputs from said decoding unit includes a first
output and a second output, and

wherein said first output is normalized with said normalization factor variable
during operation and said second output is normalized with said time constant normalization
factor.

29. (Previously Presented) The turbo decoding method according to claim 25,
wherein said normalization factor variable is calculated on the basis of means and
variance of extrinsic information produced by an associated decoding unit or units.

30. (Previously Presented) The turbo decoding method according to claim 25,
wherein said decoding unit is enabled so that the method is performed as a
parallel concatenated scheme.